U.S. Environmental Protection Agency
Office of Waste Programs Enforcement
Contract No. 68-W9-0006

TES 9

Technical Enforcement Support at Hazardous Waste Sites Zone III Regions 5,6, and 7

prc
PRC Environmental Management, Inc.

TABLE OF CONTENTS

LIST OF TABLES

TABLE OF CONTENTS (Continued)

LIST OF FIGURES

EXECUTIVE SUMMARY

PRC Environmental Management, Inc. (PRC), performed a preliminary assessment and visual site inspection (PA/VSI) to identify and assess the existence and likelihood of releases from solid waste management units (SWMUs) and other areas of concern (AOCs) at the Ferro Corporation, Chemical Division facility in Bedford, Ohio. This report summarizes the results of the PA/VSI and evaluates the potential for releases of hazardous wastes or hazardous constituents from SWMUs identified. In addition, a completed U.S. Environmental Protection Agency (EPA) Preliminary Assessment Form (EPA Form 2070-12) is included in Attachment A to assist in prioritization of Resource Conservation and Recovery Act (RCRA) facilities.

The Ferro Corporation, Chemical Division, is a large quantity hazardous waste generator that manufactures additives for the plastic and paint industries. The Ferro Corporation began operations at this 13.8 acre facility in December 1944. Ferro Corporation received RCRA interim status for storage and treatment of hazardous waste in November 1980. In 1983, the facility submitted a request to change their regulatory status to a generator. As part of their change in status the Ferro Corporation drafted a closure plan for the hazardous waste drum storage pad (SWMU 1). In 1984, the OEPA accepted Ferro's closure and reclassified the facility as a less than 90-day storage, large quantity generator. The hazardous waste drum storage pad (SWMU 1) was later reopened for use as a less than 90-day storage area.

During 1990 the Ferro Corporation generated the following wastes: heavy metal sludge, cake wastes, halogenated and nonhalogenated solvents, and waste commercial products. Ferro generated approximately 177,085 pounds of D005, D006, and D008 type wastes; 115,000 pounds of D006 cadmium wastes and approximately 3,097,527 pounds of D001, D002, D003, F002, F003, and F005 type wastes.

The PA/VSI identified the following ten SWMUs and no AOCs at the facility:

Solid Waste Management Units

1. Drum Storage Pad
2. Satellite Accumulation Areas
3. R & D Container Storage Area
4. Drum Storage in the Boiler Room
5. Cadmium Dust Collection Unit
6. Waste Oil Storage Area

7. Epoxy Wastewater Pretreatment Facility
8. Wastewater Treatment Facility
9. Sludge Bin Roll Away Container
10. Polyamine Building Construction Area

In August 1990, during the construction of a new building (SWMU 10), fifteen buried drums of waste, several laboratory bottles, gas cylinders, and crushed drums were discovered. Contaminated soil and ground water was also discovered at this location. The facility remediated this area by removing the drums, other matter and about 550 cubic yards of contaminated soil and disposing of it off site. Some contaminated perched ground water was also removed. During the VSI PRC noted stained soils in other areas of the facility; specifically, near the R&D container storage area (SWMU 3) and the banks of the onsite tributary.

Municipal water services the Ferro facility, surrounding industry, and surrounding residences; therefore, the risk of human exposure to contaminated ground water is low.

The potential for release of hazardous wastes or hazardous constituents to surface water is moderate because of the inefficiency of the oil-water separator associated with SWMU 7 and the presence of a tributary to Tinkers Creek on the western property boundary. There would be a moderate risk of human exposure to hazardous constituents, if a release occurred, because Tinkers Creek via the Cuyahoga River empties into Lark Erie upstream of public drinking water intakes for the City of Cleveland. The potential for release to air is low because of air emission control equipment and waste management techniques used by the facility. The potential of release to onsite soils is moderate because of the outdoor handling of wastes and hazardous constituents and the presence of exposed soils near several of the units. The facility is fenced and secured. Potential receptors are limited to the facility's workers.

PRC recommends that Ferro repair a broken drain cover in the drum storage pad (SWMU 1). This will minimize the potential for migration of contaminants if a release did occur in this unit. PRC recommends that analytical soil sampling be completed on visible stained soils near the R & D Container Storage Area (SWMU 3). Soil sampling is recommended to determine if hazardous constituents have been released from this unit. PRC recommends that the operational efficiency of the oil-water separator associated with the epoxy wastewater pretreatment facility (SWMU 7), and discharge Outfall No. 001, be checked. Visibly stained sediment along the banks of the onsite tributary should be sampled to determine if hazardous constituents have been released. PRC's final recommendation is to complete a comprehensive review of remediation

efforts for the Polyamine building construction area (SWMU 10). This review should focus on cleanup efforts of contaminated soils and perched ground water in the area of drum removal. Analytical sampling data should be reviewed to ensure that residual soil contamination does not exist at levels above health-based standards. No further action is recommended for the remaining SWMUs. No AOCs were identified for the facility.

1.0 INTRODUCTION

PRC Environmental Management, Inc. (PRC), received Work Assignment No. C05087 from the U.S. Environmental Protection Agency (EPA) under Contract No. 68-W9-0006 (TES 9) to conduct preliminary assessments (PAs) and visual site inspections (VSIs) of hazardous waste treatment and storage facilities in Region 5.

As part of the EPA Region 5 Environmental Priorities Initiative, the RCRA and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) programs are working together to identify and address RCRA facilities that have a high priority for corrective action using applicable RCRA and CERCLA authorities. The PA/VSI is the first step in the process of prioritizing facilities for corrective action. Through the PA/VSI process, enough information is obtained to characterize a facility's actual or potential release(s) to the environment from solid waste management units (SWMUs) and areas of concern (AOCs).

A SWMU is defined as any discernible unit at a RCRA facility in which solid wastes have been placed and from which hazardous constituents might migrate, regardless of whether the unit was intended to manage solid or hazardous waste.

The SWMU definition includes the following:

- RCRA-regulated units, such as container storage areas, tanks, surface impoundments, waste piles, land treatment units, landfills, incinerators, and underground injection wells.
- Closed and abandoned units.
- Recycling units, wastewater treatment units, and other units that EPA has generally exempted from standards applicable to hazardous waste management units.
- Areas contaminated by routine and systematic releases of wastes or hazardous constituents. Such areas might include a wood preservative drippage area, a loading-unloading area, or an area where solvent used to wash large parts has continually dripped onto soils.

An AOC is defined as any area where a release to the environment of hazardous waste or constituents has occurred or is suspected to have occurred on a nonroutine and nonsystematic

basis. This includes any area where such a release in the future is judged to be a strong possibility.

The purpose of the PA is as follows:

- Identify SWMUs and AOCs at the facility.
- Obtain information on the operational history of the facility.
- Obtain information on releases from any units at the facility.
- Identify data gaps and other informational needs to be filled during the VSI.

The PA generally includes review of all relevant documents and files located at state offices and at the EPA Region 5 office in Chicago.

The purpose of the VSI is as follows:

- Identify SWMUs and AOCs not discovered during the PA.
- Identify releases not discovered during the PA.
- Provide a specific description of the environmental setting.
- Provide information on release pathways and the potential for releases to each medium.
- Confirm information obtained during the PA regarding operations, SWMUs, AOCs, and releases.

The VSI includes interviewing appropriate facility staff, inspecting the entire facility to identify all SWMUs and AOCs, photographing all SWMUs, identifying evidence of releases, initially identifying potential sampling locations, and obtaining all information necessary to complete the PA/VSI report.

This report documents the results of a PA/VSI of the Ferro Corporation, Chemical Division facility in Bedford, Ohio. The PA was completed on April 16, 1991. PRC gathered and reviewed information from Ohio Environmental Protection Agency (OEPA) and from EPA Region 5 RCRA files. The VSI was conducted on August 15, 1991. It included interviews with

Ferro's facility representatives and a walk-through inspection of the facility. Ten SWMUs were identified at the facility. No AOCs were identified at the facility.

PRC completed EPA Form 2070-12 using information gathered during the PA/VSI. This form is included in Attachment A. The VSI is summarized and the site inspection photographs are included in Attachment B. Field notes from the VSI are included in Attachment C.

2.0 FACILITY DESCRIPTION

This section describes the facility's location, past and present operations (including waste management practices), waste generating processes, release history, regulatory history, environmental setting, and receptors.

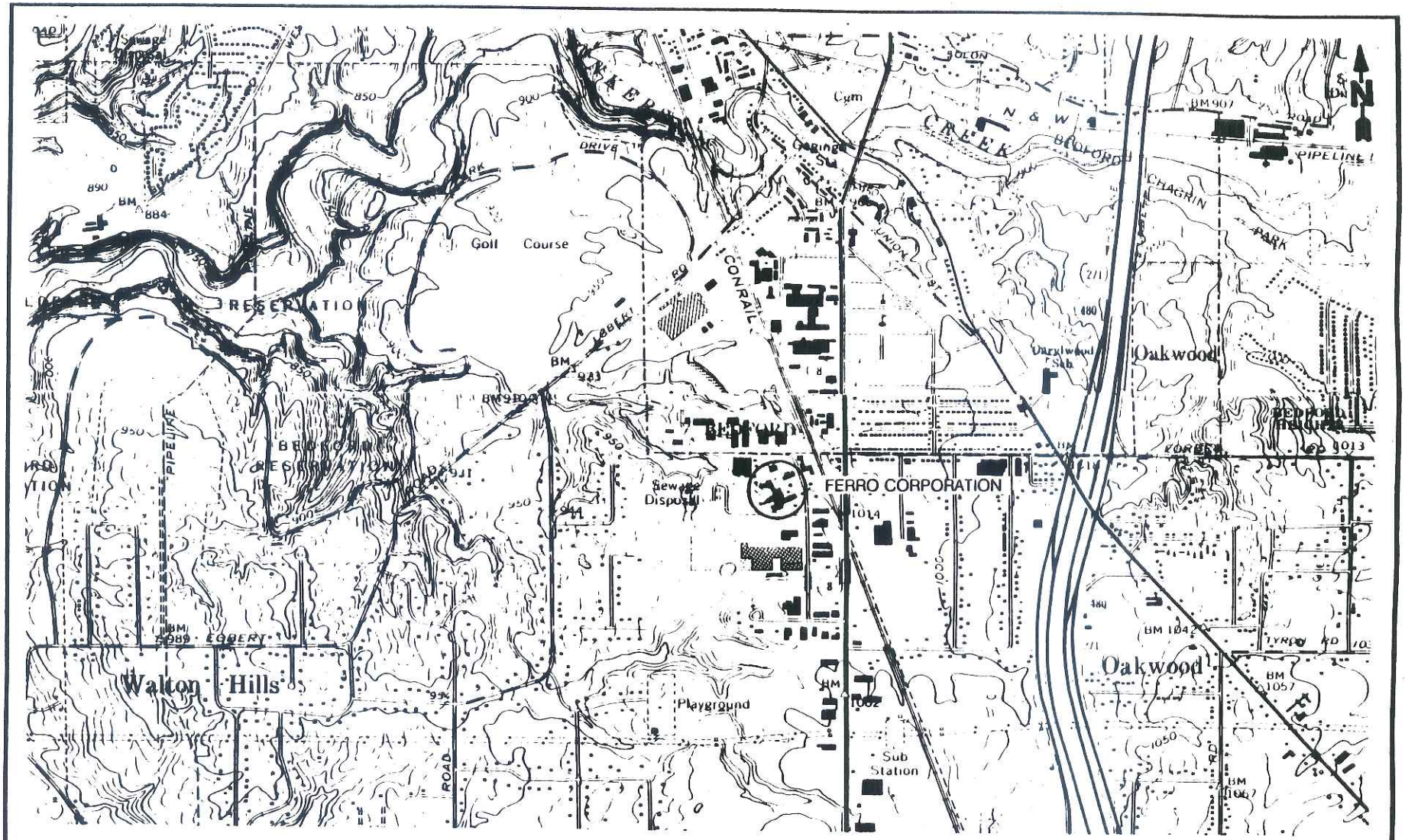
2.1 FACILITY LOCATION

The Ferro Corporation, Chemical Division is located at 7050 Krick Road in the town of Bedford, of Cuyahoga County, Ohio (Latitude 41°22'15", Longitude 81°31'48"). The property occupies approximately 13.8 acres.

The facility is bordered by Krick Road along its eastern property edge and by Treat Road along its southern property edge. Commercial and industrial office buildings are approximately a quarter-mile radius from the facility (OEPA, 1981). The closest residential area is one-quarter mile from the facility. See Figure 1 for the site location. The closest surface water exists at the west property boundary as an unnamed tributary of Tinkers Creek (OEPA, 1989). No public or private wells exist within a quarter mile boundary of the facility. Water is supplied through the Cleveland municipal drinking water system (Hofmeister, 1991). Industrial and sanitary wastewater is pretreated at the facility in the wastewater treatment system (Hofmeister, 1991). Pretreated process wastewater and site storm water is discharged to the Northeast Ohio Regional Sewer District (NEORSD) to the Southerly wastewater treatment plant (Sadowski, 1991).

2.2 FACILITY OPERATIONS

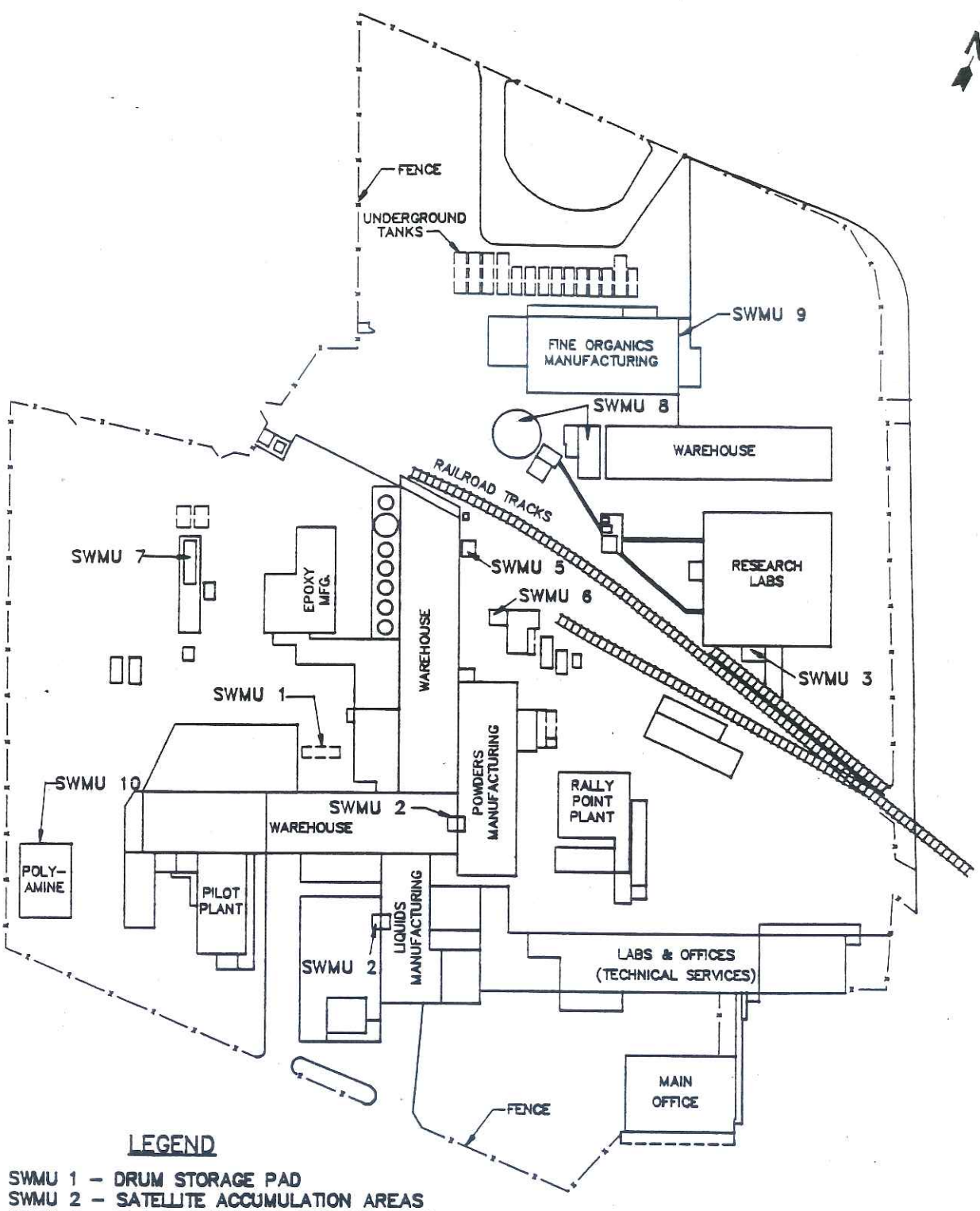
The property was formerly owned by Chase Dryer, a manufacturer of chemical ingredients that serve as paint dryers (Sadowski, 1991). In the early 1940's, Ferro Corporation acquired the facility and the majority of the present property from Chase Dryer and has since acquired the remainder of the property (Hofmeister, 1991). An old Chase Dryer chemical plant existed prior to 1942. Ferro's manufacturing operations were initiated December 15, 1944 (Ferro, 1980b). At the time of initial operations 146 individuals were employed by the facility and operations were run 24 hours per day, 15 shifts per week, 50 weeks per year (Ferro, 1980a). Currently Ferro employs 150, working three shifts five to seven days a week. The facility layout is presented in Figure 2.



FERRO CORPORATION, CHEMICAL DIVISION
NORTHFIELD, SHAKER HEIGHTS, OHIO

FIGURE 1
FACILITY LOCATION

PRC ENVIRONMENTAL MANAGEMENT, INC.



LEGEND

SWMU 1 – DRUM STORAGE PAD
SWMU 2 – SATELLITE ACCUMULATION AREAS
SWMU 3 – R & D CONTAINER STORAGE AREA
SWMU 4 – DRUM STORAGE IN THE BOILER ROOM
SWMU 5 – CADMIUM DUST COLLECTOR UNIT
SWMU 6 – WASTE OIL STORAGE AREA
SWMU 7 – EPOXY WASTEWATER PRETREATMENT FACILITY
SWMU 8 – WASTEWATER TREATMENT FACILITY
SWMU 9 – SLUDGE BIN ROLL AWAY CONTAINER
SWMU 10 – POLYAMINE CONSTRUCTION AREA

NOTE: LOCATIONS FOR SWMUS 4 AND 2 WERE NOT FULLY DOCUMENTED

60' 0 60' 120'
APPROXIMATE SCALE: 1" = 120'

FERRO CHEMICAL CORPORATION
WALTON HILLS, OHIO

FIGURE 2

FACILITY LAYOUT

PRC ENVIRONMENTAL MANAGEMENT, INC.

FERROLAY.DWG – 09/27/91 – CFR

The facility has three main operations: chemical manufacturing, technical services, and research and development. The manufacturing involves producing additives for the paint and plastics industries (Hofmeister, 1991). Batch processing of alkyl and aryl phosphates, metal salts and metal oxides is involved in the manufacture of the following materials (OEPA, 1983): organo-metallic compounds used as thermal stabilizers for polyvinyl chloride (PVC) plastics, organic and organo-metallic UV light stabilizers for plastics, epoxized vegetable oil used as a plastic stabilizer, and organo-metallic paint driers.

2.3 WASTE GENERATING PROCESSES

Ferro generates several waste streams from their production process. The generation and management of these waste streams are discussed below. Table 1 lists the SWMUs identified at Ferro and their status. Table 2 depicts the solid wastes generated at the facility, their source, and the units in which the waste is managed.

Ferro generates sludge in their metal carboxylate process as a result of its manufacturing operations. These sludges are considered heavy metal sludges which exhibit EP toxicity characteristics. The sludges contain the following metals: zinc, barium, cadmium and lead (D006, D005, D008). Heavy metal sludge waste is managed in the sludge roll away container (SWMU 9) (Sadowski and PRC, 1991). Ferro's generator annual hazardous waste report for 1990 (Ferro, 1991) reported the generation of 177,085 pounds of D005, D006 and D008 type wastes. Cadmium dust is also generated in the production of Ferro's products. The dust is collected in a cadmium dust collection unit (SWMU 5), drummed in 55-gallon steel barrels and stored in the drum storage pad (SWMU 1) prior to offsite disposal. The presence of heavy metal containing dust, generated from the production of many of Ferro's products, was noted on the floor of the manufacturing building during the VSI. This dust is periodically cleaned from the floor and drummed in 55-gallon steel barrels and stored at the drum storage pad (SWMU 1).

The facility's organic, phenol, and nickel processing department generates spent halogenated and nonhalogenated waste solvents and tar-like residue from internal solvent reclaiming (D001, D005, D006, F002, F003, and F005). These wastes are stored in 55-gallon steel drums and managed at the drum storage pad (SWMU 1) prior to disposal offsite. Ferro's generator annual hazardous waste report for the year 1990 reported generating approximately 3,097,527 pounds of these wastes in 1990.

Table 1

Solid Waste Management Units (SWMUs)

SWMU Number	SWMU Name	RCRA Hazardous Waste Management Unit*	Status
1.	Drum Storage Pad	Yes	Active, unit underwent RCRA closure in 1984 and was later reopened for less than 90-day storage
2.	Satellite Accumulation Areas	No	Active
3.	R & D Container Storage Area	No	Active
4.	Drum Storage Area in the Boiler Room	No	Inactive
5.	Cadmium Dust Collection Unit	No	Active
6.	Waste Oil Storage Area	No	Active
7.	Wastewater Pretreatment Facility	No	Active
8.	Wastewater Treatment Facility	No	Active
9.	Sludge Bin Roll Away Container	No	Active
10.	Polyamine Construction Area	No	Inactive

* A RCRA hazardous waste management unit is one that currently requires or formerly required a RCRA Part A or Part B permit.

Table 2

Solid Wastes

Waste/EPA Waste Code	Source	Primary Management Unit
Spent solvent Wastes (D001, D005, D006, F002, F003, F005)	Organic, Phenol and Nickel Processing Department	1, 2, 4
Heavy metal sludge with barium, cadmium, and lead (D005, D006, D008)	Metal Carboxylate Process	1, 2
Process filtercake (D001, D005, D006, F003, F005)	Wastewater Treatment	7, 8, 9
Commericial chemical product wastes (U211, U044, U028, U077, U213, U190)	R&D Laboratory	2, 3
Waste acids (D002) corrosive liquid and solids (D002), flammable liquid and solids (D001), Resorcinol (U201), and solvents (F003)	Polyamine Building Construction Area	10
Cadmium dust (D006)	Dust Collection Unit	5
Contact wastewaters (D001, D005, D006, F002, F003, F005)	Process Activities	8
Noncontact wastewater	Process Activities	7
Waste oil	SWMUs 7 & 8	6

The research laboratories generate commercial chemical product wastes (U211, U044, U028, U077, U213, and U190). These wastes are stored in 55-gallon drums and managed at the R & D Container storage area (SWMU 3) and then moved to the drum storage pad (SWMU 1) prior to removal offsite. Additional wastes generated at the facility during daily operations include characteristic ignitable wastes, corrosive wastes, and toxic wastes.

Wastewaters are generated from all manufacturing operations at the site. Wastewater sources include the boiler blowdown, cooling water, quench water and cooling tower blowdown from the pretreatment steam stripper and condensate processes. Noncontact process wastewater is subject to immediate pretreatment at the epoxy waste water pretreatment facility (SWMU 7) (Hofmeister, 1991). Water collected from the process tank farm is also subject to pretreatment at SWMU 7.

Contact wastewater is diverted to the liquid wastewater treatment system (SWMU 8). The liquid wastewater treatment system (SWMU 8) includes the following procedures: breaking oil emulsions with acid, separation of oil, neutralization with lime, chemical precipitation, filtration, clarification, and sludge dewatering (OEPA, 1975). Waste oil is removed from effluent, with an API separator. The waste oils are stored in 55-gallon steel drums at the waste oil storage area (SWMU 6) and removed offsite by a waste oil contractor (Hofmeister, 1991). Treated effluent is sent to the NEORSD Southerly wastewater treatment facility. Sludge from the liquid wastewater treatment plant (SWMU 8) and from the epoxy waste water pretreatment system (SWMU 7) is collected, thickened and then stored in the bin roll-away container (SWMU 9) until it is transported to an offsite landfill (Sadowski, 1991).

Storm water enters outfall drains that discharge into an unnamed tributary of Tinkers Creek, located on the west property boundary. Outfall No. 001 collects off-site drainage from Krick Road by means of a catch basin, as well as from Treat Road from a sewer and ditch along the southern property line. Storm water from roof drains also discharge through Outfall No. 001 (Alpha Consultants, 1989). Prior to discharge into the receiving stream, waste water from Outfall No. 001 is treated at the epoxy pretreatment facility (SWMU 7) through an oil/water separator (Sadowski, 1991). Outfall No. 002 collects run-off from Treat Road and receives no dry weather flow. Outfall No. 003 collects percolation from drains around hydrogen peroxide storage tanks. Flow occurs when groundwater intrusion is high and is not relieved by pumping (Alpha Consultants, 1989).

2.4 RELEASE HISTORY

Several releases have been documented for the facility. The following summarizes available details of site releases:

On October 12, 1976, a fire in Ferro's warehouse was reported. No details on releases to environmental media are available (OEPA, 1982; Sadowski, 1991).

On March 29, 1979, an accidental overflow of an emergency impoundment containing water, 3% formic acid, less than 1% hydrogen peroxide and epoxized soybean oil occurred, along with an overflow of an oil separator trap at Outfall No. 001. The spill was detected by Ferro and by the OEPA. The release entered a tributary of Tinkers Creek. The release was remediated by skimming the tributary (Ferro, 1979).

April 16, 1981, oil spill. No information available (OEPA, 1982; Sadowski, 1991).

January 9, 1982, phenol spill. No information available (OEPA, 1982; Sadowski, 1991).

July 30, 1984, an oil leak was reported during a RCRA visual inspection of the facility. The RCRA inspector reported an oil leak on the south side of the facility, east of the process material storage tank farm area (OEPA, 1984c). No additional information was available.

January 4, 1988, a methanol release was documented. The spill occurred while loading a tank truck at the facility (Ferro, 1988). The 14.54 pounds of contaminated soil that resulted from the spill was transported via Metropolitan Transfer to the Wayne Disposal Facility.

June 8, 1988, a tall oil fatty acid leak was discovered in a process underground storage tank located on the facility. Ten cubic yards of contaminated soil was excavated from the site and transported to an offsite landfill (Waste Materials Management, 1988).

On August 9, 1990, the facility reported to the EPA Hotline that two unlabeled drums of unknown contents had been uncovered during excavation for the polyamine building area. Excavation activities were immediately stopped. One drum was reportedly open. An odor and discoloration was associated with the clay soils within the excavated area. Wood was also found to be mixed with the soil. Hart Environmental was commissioned to locate additional buried drums

with a magnetometer and SRI. Twelve unlabeled drums were located. Two drums were polydrums and the remaining were corroded steel drums. On August 10, 1990, BHM Analytical Laboratory Inc. was contracted to analyze soil and water samples from the site where the first drum was found. The following results were received August 15, 1990: the water samples contained high quantities of xylene and the soil samples contained 1,1,2,2-Tetrachloroethane (BHM, 1990).

Removal of the 15 drums began on August 21, 1990 by Samsel Services Inc. During the removal, 3 additional drums were discovered by Samsel Services. Treatment of the drums and associated contents consisted of transfer into overpack drums. On August 23, 1990, the facility discovered and reported information which revealed that the ditch had been dug in the 1970s by Ferro to dump waste filled drums (McLaren/Hart, 1991 and Sadowski, 1991).

2.5 REGULATORY HISTORY

The facility submitted a RCRA part A permit application for its hazardous waste activities on November 12, 1980 (Ferro, 1980b). The application listed Ferro Corporation, Chemical Division as a hazardous waste generator and storage facility. The facility also submitted notification of two on-site treatment processes: (1) destruction by hydrolysis with live steam and (2) distillation to recover usable quality solvents (Ferro, 1980b).

The facility submitted a request to be removed from the RCRA permitted hazardous waste storage and treatment facility list on June 2, 1983 (Ferro, 1983). However, the EPA determined that the facility must submit a formal closure plan for its waste storage facility pursuant to 40 CFR 265.112, because wastes were accumulated at the facility for greater than 90 days. On December 13, 1983, the Ohio EPA received a closure plan from the facility to close a RCRA-regulated hazardous waste drum storage pad (SWMU 1), which identified 69 drums of hazardous waste to be removed from the site. Decontamination of the area was not required (Ferro, 1983) because the drum storage area was paved, and no contaminated soil or equipment was expected to be handled. On April 20, 1984, the Ohio EPA accepted Ferro's closure and reclassified Ferro from a treatment and storage facility to a less than 90-day large quantity generator (OEPA, 1984a).

The facility has a waste water discharge NPDES permit (No. OH00022291) approved by the OEPA (no. E320*AD). The permit expired March 16, 1980, and a draft permit was issued May 18, 1987. The draft permit was not finalized due to expected modifications to storm-water

May 18, 1987. The draft permit was not finalized due to expected modifications to storm-water drains on the western property edge (OEPA, 1989). A permitted oil/water separator treatment system began operation on December 5, 1979. The permit allowed for the following discharges:

1. Pretreated sanitary sewer wastes to be discharged into the NEORSD sewer district
2. Pretreated process wastes to be discharged into the sewer district
3. Pretreated storm sewer run-off and noncontaminated cooling water to be discharged through Outfall No. 001 into an unnamed tributary of Tinkers Creek (OEPA, 1989). Permit regulations require that flow and pH from Outfall No. 001 be monitored and reported every two weeks. Flow, pH, water temperature, oil and grease are reported twice a month. Samples are analyzed by Water Management Inc., or Environmental Research Group Inc. (EPA, 1989).

Several violations to Ferro's NPDES permit have been recorded. These violations included the discharge of contaminants to Tinkers Creek in quantities in excess of state water quality standards. OEPA requested Ferro to submit a comprehensive plan to eliminate outfall contamination (OEPA, 1988). On January 20, 1989, Ferro submitted to the OEPA a report on outfall studies for their facility. This report made recommendations to reroute wastes and discharge some wastes to existing sanitary sewer systems (Alpha Consultants, 1989).

The facility has several OEPA air permits regulating the emissions of discharged dusts from the facility (PRC, 1991). No violations to air permits have been recorded.

Several RCRA inspections of the facility have been completed during Ferro's operations at the subject site. Violations identified during the RCRA inspections are as follows:

A RCRA inspection of the facility on July 23, 1981 identified the following violations (OEPA, 1981):

1. Failure to conduct waste analysis of accumulated wastes, pursuant to 40 CFR 265.13.
2. Improper waste analysis and treatment of F005 wastes, pursuant to 40 CFR 265.225.
3. Lack of aisle space in drum storage area, pursuant to 40 CFR 265.35.
4. Lack of personnel training with respect to hazardous waste regulations, pursuant to 40 CFR 265.16.

5. Failure to record waste disposal manifests.

A RCRA inspection of the facility on February 1, 1984, identified the following violations (OEPA, 1984):

1. Failure to list a solvent recycling process as a hazardous waste treatment.

2. Improper storage of waste drum in an unregulated storage area.

3. Improper stenciling and dating of drums.

The facility responded to the reported violations as follows:

1. Solvent treatment is considered a part of the manufacturing process.

2. Weather prevented the immediate transfer of drums from the epoxy area to the boiler room storage pad.

3. The operator had been instructed in the proper procedure for stenciling and dating of waste barrels.

A RCRA inspection of the facility on January 6, 1988, identified the following violations (OEPA, 1988):

1. Failure to include U190 waste on the submitted Part A (40 CFR 270.14, oac 3745-50-43).

2. Failure to clearly label and date small waste containers and above ground storage tank (40 CFR 262.34 (a) and (b) and AC 3745-52-34 (A) and (B)).

3. Improper employee training with respect to hazardous waste management (40 CFR 265.16 and OAC 3745-65).

4. Lack of job titles.

5. Incomplete contingency plan.

6. Open hazardous waste storage drums.

7. Failure to conduct regular testing of hazardous waste storage tanks.

8. Improper verification of F001-F005 waste disposal.

A RCRA inspection of the facility on March 29, 1990 identified the following violations:

1. Failure to conduct annual training.

2. Incomplete contingency plan.

3. Improper containment and labeling of hazardous waste storage drums.

4. Improper use of storage tank.

An inquiry was made into the hazardous waste status of two process tanks (Nos. 16 and 20N), on April 9, 1990 a violation of hazardous waste regulations was reported by the Ohio EPA. Meetings and correspondence on May 22, 1990, June 8, 1990, and July 10, 1990 later determined that the tanks were not subject to hazardous waste rules because the tanks were used to store process chemicals (Ferro, 1990). The tanks temporarily stored mother liquor between steps of a crystallization process in the Fine Organics department. The liquor was recycled back into the process until it was no longer considered useful. The spent liquor was then transferred to an outside tanker trailer, which is sent to Hukill chemical for solvent reclamation (Ferro, 1990).

2.6 ENVIRONMENTAL SETTING

This section describes the climate, flood plain and surface water, geology and soils, and ground water in the vicinity of the Ferro facility.

2.6.1 Climate

Average temperatures in the Cleveland area range from a low of 26 degrees Fahrenheit (°F) in January to a high of 72°F in July. Northern areas nearest Lake Erie are markedly colder than the rest of the area in summer. Precipitation is well distributed during the year. From late fall through winter, snow squalls are frequent and total snowfall is normally heavy. Of the total annual precipitation, 60 percent usually falls in April to September. Average relative humidity in midafternoon is about 60 percent, humidity is greater at night, and the average at dawn is about 80 percent. The percentage of possible sunshine is 70 percent in summer and 30 percent in winter. The prevailing wind direction is from the south. Average wind speed is 13 miles per hour, in January. Average annual precipitation is 35.4 inches, and the intensity of a 1-year 24 hour rainfall is 2 inches. Average annual net precipitation is approximately 5.4 inches (National Oceanic Atmospheric Administration, 1990).

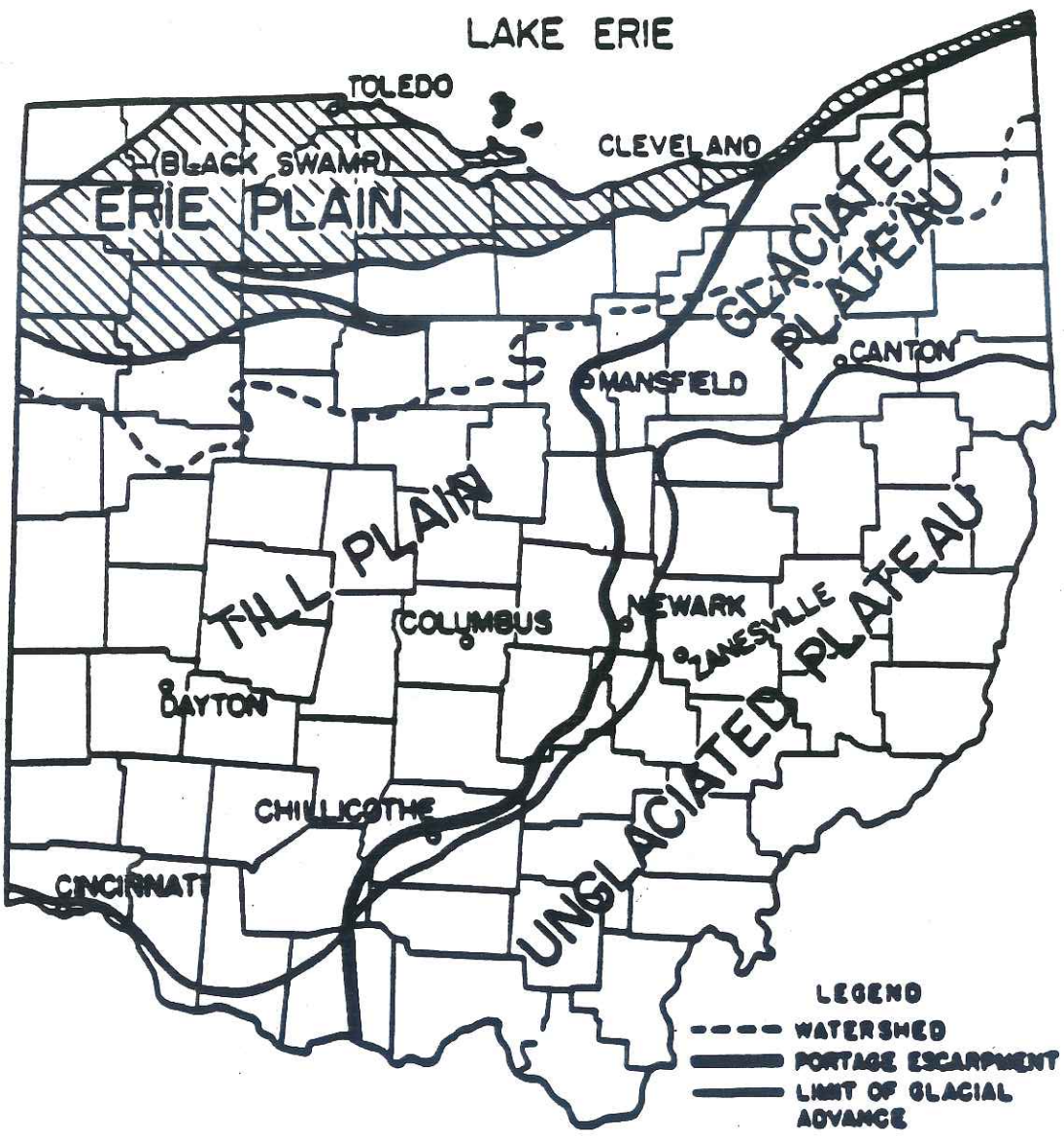
2.6.2 Flood Plain and Surface Water

On the Ferro Corporation's property is a small intermittent tributary to Tinkers Creek. This small tributary receives storm water run-off which recently has been diverted via underground culverts from the road east of the facility under the property and into the creek (PRC, 1991). Downstream of the intermittent creek approximately 3/4 of a mile, is Tinkers Creek, which flows into the Cuyahoga River. Half a mile east and west of the plant flow other unnamed intermittent streams. Both of these streams are also tributaries of Tinkers Creek. The facility is not located in a 100-year flood-prone area (U.S. Geological Survey, 1974).

2.6.3 Geology and Soils

The exposed rocks of the area are of sedimentary origin and range in age from late Devonian to Pleistocene. They fall into two general classes: indurated stratified rocks of late Devonian and early Carboniferous age, and unconsolidated surficial deposits of Pleistocene age. The surficial deposits consist mainly of Pleistocene glacial and lacustrine deposits and recent alluvium. These Pleistocene deposits form a blanket over the bedrock ranging in thickness from 0 to 440 feet. The indurated rocks everywhere crop out in the beds and gorges of streams, quarries, and other excavations. The total thickness of Paleozoic strata exposed in this area is about 750 feet. These beds consist of shale, sandstone, and conglomerate of late Devonian, early Mississippian, and early Pennsylvanian age (Leverett, 1931).

As seen in Figures 3 and 4, the rock sections in the Cleveland area, separated by varying thicknesses of weak shale, mark the surface of the Appalachian Plateau and the two lesser platforms on the slope of the Portage Escarpment. The uppermost of the rocks in this formation is the Sharon Conglomerate, of lower Pennsylvanian age. It is the youngest exposed Paleozoic rock in this area, and is the capstone formation of the plateau across northeastern Ohio. Below the Sharon Conglomerate, other formations include: the Orangeville and Meadville shales from the Mississippian age; the Cleveland and Bedford shales, classified by some as upper Devonian and by others as lower Mississippian age, and the Chagrin Shale of late Upper Devonian age. Figure 5 shows these rocks as they appear in the area below Cleveland (Leverett, 1931). Exposed rocks are underlain by large thicknesses of Devonian, Silurian, and Ordovician formations, and presumably of Cambrian also, resting on a floor of Pre-Cambrian crystalline rocks.



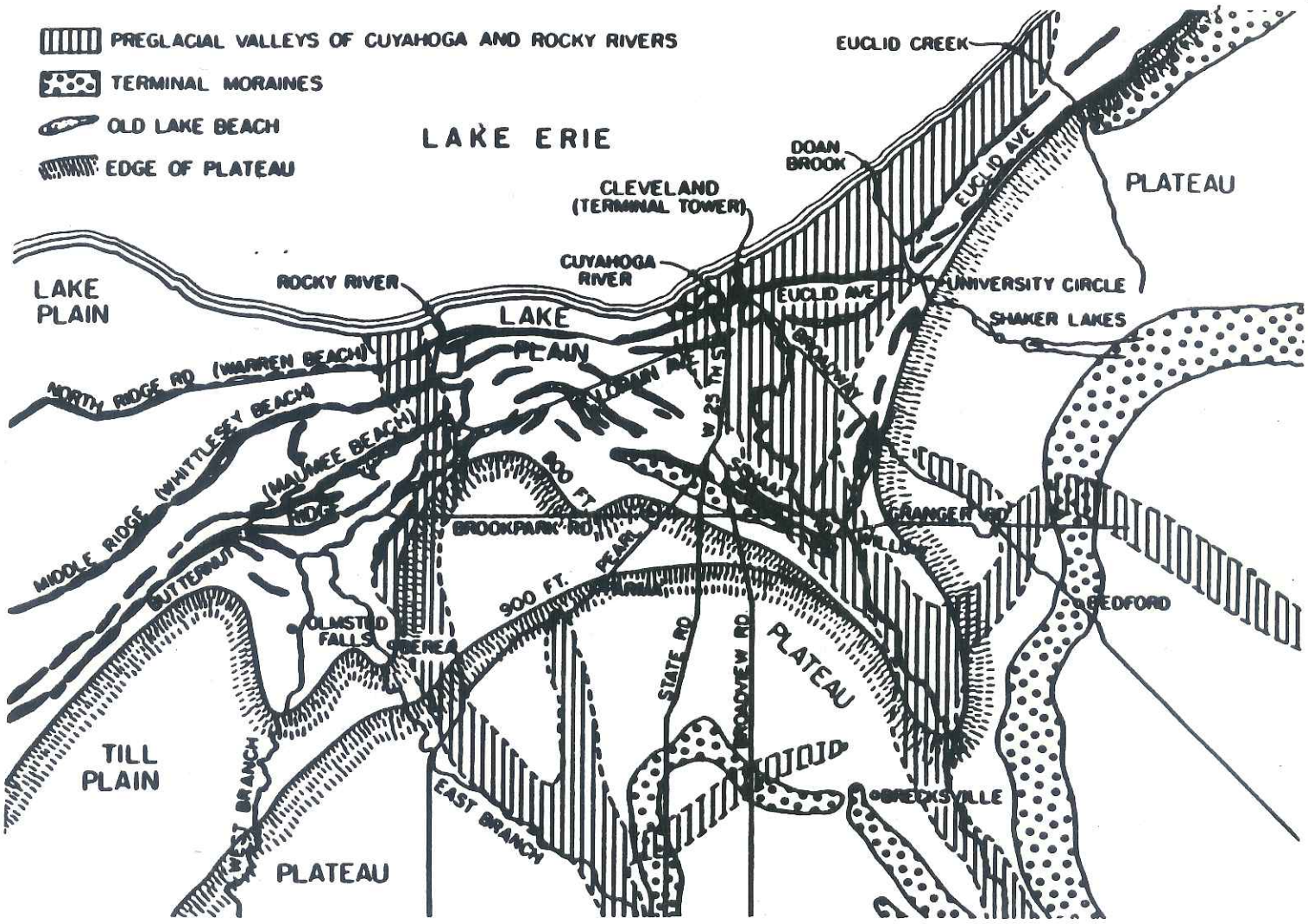
SCALE NOT AVAILABLE

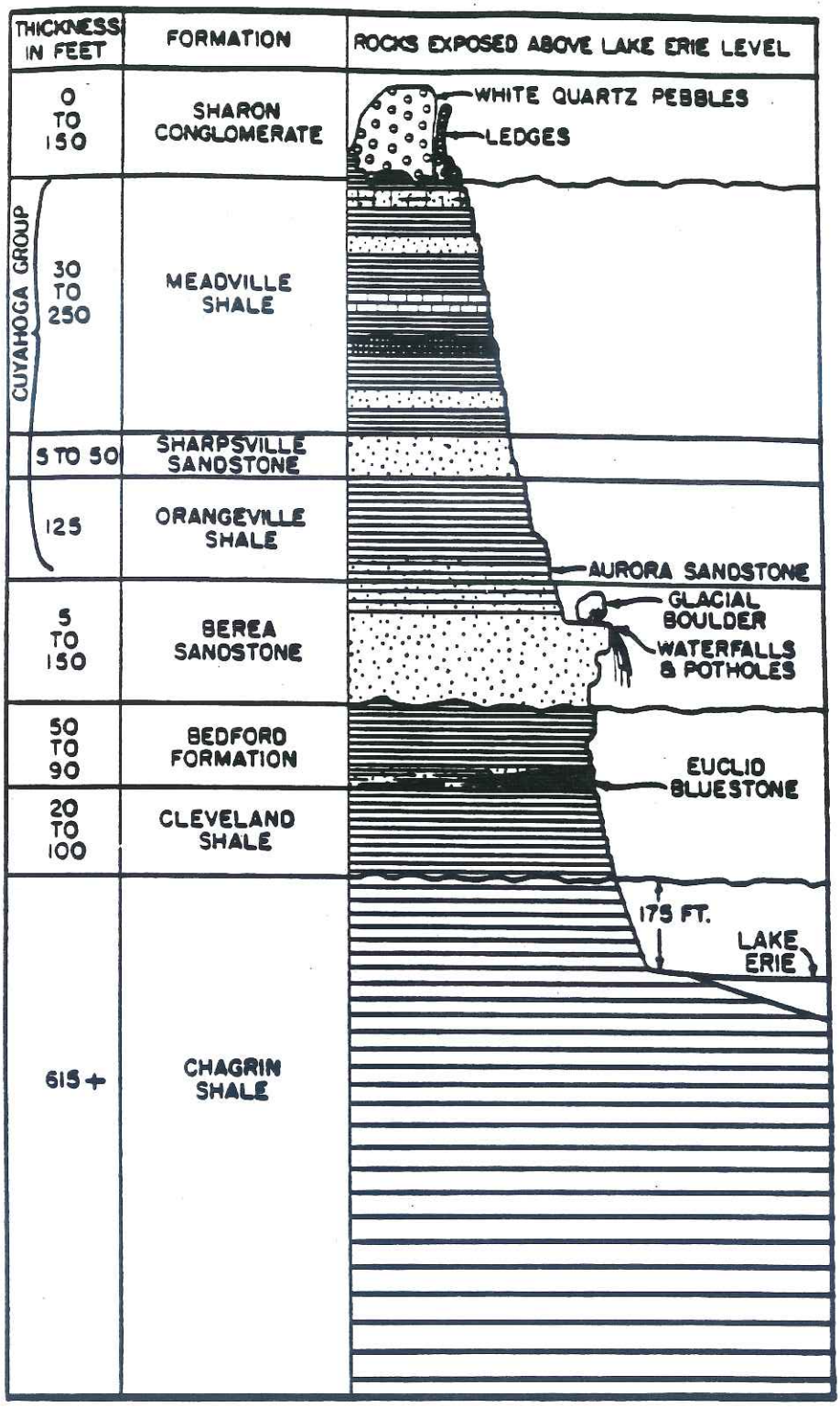
SOURCE: WILLIAMS, 1940

FERRO CHEMICAL CORPORATION
WALTON HILLS, OHIO

FIGURE 3
PHYSIOGRAPHIC BOUNDARY LINES IN OHIO

ENVIRONMENTAL MANAGEMENT, INC.


PREGLACIAL VALLEYS OF CUYAHOGA AND ROCKY RIVERS
TERMINAL MORAINES
OLD LAKE BEACH
EDGE OF PLATEAU
LAKE ERIE
EUCLID CREEK
DOAN BROOK
CLEVELAND (TERMINAL TOWER)
CUYAHOGA RIVER
ROCKY RIVER
LAKE PLAIN
LAKE PLAIN
PLATEAU
EUCLID AVE
UNIVERSITY CIRCLE
SHAKER LAKES
NORTH RIDGE RD (WARREN BEACH)
MIDDLE RIDGE (WHITTLESEY BEACH)
(MAUMEE BEACH)
RIDGE
BROOKPARK RD
W. 25TH ST
BROADWAY
900 FT.
900 FT.
PEARL
GRANGER RD
BUTTERNUT
OLMSTED FALLS
CBERLIN
STATE RD
BROADVIEW RD
PLATEAU
BEDFORD
TILL PLAIN
WEST BRANCH
EAST BRANCH
BRECKSVILLE
PLATEAU
N
SCALE NOT AVAILABLE
SOURCE: WILLIAMS, 1940
FERRO CHEMICAL CORPORATION
WALTON HILLS, OHIO
FIGURE 4
GEOLOGICAL FEATURES
OF THE CLEVELAND AREA
ENVIRONMENTAL MANAGEMENT, INC.



SOURCE: WILLIAMS, 1940

FERRO CHEMICAL CORPORATION
WALTON HILLS, OHIO

FIGURE 5
REPRESENTATIVE GEOLOGIC CROSS-SECTION
OF THE CLEVELAND AREA

ENVIRONMENTAL MANAGEMENT, INC.

The soils around the plant are of the Mahoning-Urban land complex. These soils consist of deep, somewhat poorly drained Mahoning soil and Urban land in broad undulating areas on till plains and on the higher parts of the lake plains. These soils are 55 percent Mahoning silt loam and 30 percent Urban land. Slopes typically range from 0 to 6 percent. Typically, the Mahoning soil has a surface layer of dark grayish brown silt loam about 7-inches thick. The subsoil is about 32-inches thick. It is yellowish brown, dark yellowish brown, and olive brown silty clay loam that is mottled and firm. Olive brown, mottled firm silty clay loam and clay loam below the subsoil, reaches to depths of approximately 60 inches.

Ferro retained a firm to conduct soil permeability tests in the area of the recently constructed Polyamine building. The permeability tests were conducted in triaxial cells using a 5 psi confining pressure and an initial head of 5 feet over a 10 day period. Soil samples taken from a depth of approximately 5 to 10 feet had a vertical permeability of approximately $1.55E^{-7}$ centimeters per second (cm/sec) and a horizontal permeability of $1.90E^{-6}$ cm/sec (McLaren/Hart Environmental, 1991).

Throughout most of Ferro's property the Urban land soils are not readily discernible because of man-made obstacles such as streets, parking lots, buildings, and other structures that so obscure or alter the soils that identification is not feasible.

2.6.4 Ground Water

Site specific ground water information is not available; therefore, regional information is presented.

The aquifers in the region are considered to be a good to fair source of ground water. Wells in the Cuyahoga group yield as much as 70 gpm but more commonly yield between 5 and 10 gpm. Should insufficient water be obtained by wells in the shales and interbedded sandstones of the Cuyahoga group, the wells can be drilled into the underlying Berea sandstone for an adequate water supply. The Berea sandstone will yield as much as 20 gpm to domestic wells and 250 gpm to larger wells. Generally, yields up to 100 gpm may be developed in the formation. This type of aquifer is more commonly known as the Cuyahoga group/Berea sandstone. There are also water bearing sandstone strata within the Cleveland, Chagrin and underlying shales of Portage age (Leverett, 1931).

McLaren/Hart identified the presence of a perched ground water table, at 6 to 8 feet from ground surface, during the buried drum remediation at the facility (McLaren/Hart, 1990).

There are no sensitive environments within two miles of the facility.

2.7 RECEPTORS

Bedford, Ohio is a suburb of Cleveland, Ohio. The population of the City of Bedford is approximately 14,500. The facility is located in a light industrial and residential area. The residential area of Bedford is located 1/2 mile west of the facility.

The nearest surface water is a tributary to Tinkers Creek located along the western boundary. This tributary empties into Tinker's Creek which is approximately 3/4 of a mile north of the facility. Tinker's Creek flows northwest into the Cuyahoga River, which in turn flows into Lake Erie. The nearest downstream drinking water intake is Lake Erie, which is the public water supply for the City of Cleveland suburbs. The use of residential water wells as a drinking water source located within a one-mile radius of the facility has not been determined. Municipal water services both the Ferro facility and the surrounding residences, therefore, the use of ground water for drinking purposes is unlikely. The location and number of wells in proximity to the facility is unknown.

The prevailing wind direction is from the south. Under these conditions, air emissions from the plant pose a low potential for human exposure, because the residential population is located 1/2 mile to the east and west of the facility. An industrial complex is located less than 1/4 mile south of the facility. The employees working in the complex are at risk of exposure to hazardous constituents if air emissions are released from the facility.

3.0 SOLID WASTE MANAGEMENT UNITS

This section describes the ten SWMUs identified during the PA/VSI. The following information is presented for each SWMU: description of the unit, dates of operation, wastes managed, release controls, history of release, and PRC observations.

SWMU 1 **Drum Storage Pad**

Unit Description: The Drum Storage Pad is an outside unit, located in the west central portion of the facility adjacent to the powders manufacturing warehouse. Figure 2 shows the approximate location of SWMU 1. This unit occupies an area of approximately 40 feet by 80 feet. The unit consists of a concrete pad sloped toward a central catch basin in the center of the unit. This unit underwent RCRA closure in 1984 and was reopened for less than 90-day storage of hazardous waste. SWMU 1 is shown in Photographs 1, 2, and 3 of Appendix B. The catch basin drains into the wastewater treatment facility (SWMU 8) (Sadowski, 1991). A second drainage pipe with a broken cap was noted along the southwestern wall of the unit, this drain discharges directly into the storm water separator (Hofmeister, 1991). Several 55-gallon, and larger overpack steel drums on wooden pallets are stored in this unit. This unit is confined on the east, west and south sides by buildings. A locked chainlink fence exists on the north side. This unit was the area of former underground diesel storage tanks. The underground storage tanks were abandoned in place by backfilling with concrete (Hofmeister, 1991).

Date of Startup: Unknown.

Date of Closure: Unit is presently active.

Wastes Managed: This unit manages all types of wastes derived at the facility, with the exception of sludge from SWMUs 7 and 8. Wastes managed in this SWMU include methyl ethyl ketone (F005), xylene (F003), heavy metals; cadmium (D006), lead (D008), barium (D005), waste oils (D001), carbon disulfide (P022), tetrachloromethane (U211), Phthalic anhydride (U190), tetrahydrofuran (U213), 1,2-dichloroethane (U077), bis(2-ethylhexyl) phthalate (U028), chloroform (U044), spent halogenated solvents (F002), nonhalogenated wastes (F003, F005), and other wastes listed in Table 2. These wastes are disposed of offsite.

Release Controls: The wastes are contained in steel drums on a concrete pad with drainage towards a central catch basin. This catch basin drains into the wastewater treatment plant (SWMU 8).

History of Release: None documented.

Observations: During the VSI, staining of the concrete pad was noted in the drum storage area (PRC, 1991). Staining and a broken drain cap is evident in Photograph 3 of Attachment B. A visible sheen was also noted on standing water in the

catch basin in the center of this unit as seen in Photograph 2 of Appendix B.

SWMU 2 **Satellite Accumulation Areas**

Unit Description: The Ferro Corporation currently maintains six satellite accumulation areas located throughout the facility. Typically, these areas consist of a single 55-gallon steel drum located on a concrete floor within a building. For example, the satellite accumulation area shown in Photograph 4 is located between the warehouse and the powders manufacturing area of the facility. Figure 2 depicts the locations of two of the satellite accumulation areas found at the Ferro facility.

Date of Startup: Unknown.

Date of Closure: These units are currently operational.

Wastes Managed: Wastes typically managed in satellite accumulation areas include hazardous constituents such as: spent solvents, methyl ethyl ketone (F005), xylene (F003), and heavy metals, cadmium (D006), lead (D008), and barium (D005). For example, Press Cake waste from the Horizontal Leaf Filter is characteristically hazardous due to the cadmium constituents (D006). Floor sweepings from some process areas contain D005, D006, and D008. Other wastes managed in satellite accumulation areas include laboratory waste contained in lab packs. These wastes are disposed of offsite.

Release Controls: No specialized engineering controls exist; however, the waste is contained in steel drums located in the facility's buildings that have concrete floors.

History of Release: None documented.

Observations: During the VSI the drums used in the satellite accumulation areas appeared to be in good condition, and no staining was observed in the immediate area around the containers. The drum shown in Photograph 4 is a satellite accumulation area containing floor sweepings, and hazardous constituents (D005, D006, D008).

SWMU 3 **R & D Container Storage Area**

Unit Description: The R & D container storage area consists of several 55-gallon steel drums located on wooden pallets outside the research and development area of the facility. The 20 by 20 foot area is on a raised concrete loading dock adjacent to the rail road tracks.

Date of Startup: Unknown.

Date of Closure: Unit is currently active.

Wastes Managed: During the VSI seven drums of various wastes were staged in this unit. The drum labels indicated that the hazardous constituents of the wastes included: spent solvents, methyl ethyl ketone (F005), xylene (F003), and

heavy metals: cadmium (D006), lead (D008), and barium (D005) (PRC, 1991). The facility representatives indicated that laboratory packs of obsolete chemicals were also typically staged in this unit.

Release Controls: The waste is stored in steel drums on a concrete loading platform. No additional engineering controls were noted.

History of Release: None documented.

Observations: During the VSI stains on the loading platform wall and adjacent soil was noted (PRC, 1991). The staining is evident in Photograph 5 of Attachment B. It was not clear whether the staining resulted from a release of the wastes managed in the unit or from product loading and unloading operations that are conducted in the same area.

SWMU 4 **Drum Storage in the Boiler Room**

Unit Description: This SWMU consisted of several areas that were used to accumulate hazardous waste (Sadowski, 1991). PRC has labeled this unit as "Drum Storage in the Boiler Room" to be consistent with information found in correspondence regarding the facility. The waste was accumulated in 55-gallon steel drums in the facility's boiler room and in other parts of facility. This unit was not photographed during the VSI.

Date of Startup: Unknown.

Date of Closure: The facility consolidated the drum storage areas and began storing the waste in SWMU 1 prior to 1990.

Wastes Managed: Drums of various wastes generated throughout the process areas of the facility were drummed and stored for less than 90 days in the areas that made up this unit. Wastes typically stored in this unit were similar to those currently managed in SWMU 1.

Release Controls: This unit consisted of steel drums stored inside the facility's buildings.

History of Release: None documented.

SWMU 5 **Cadmium Dust Collection Unit**

Unit Description: This SWMU is a 15-foot high cadmium dust collector. At the base of the steel unit any collected dust is transferred to 55-gallon steel drums that are kept at the base of this unit. The cadmium dust collection unit is located outside the manufacturing building near the waste oil storage area (SWMU 6) as shown in Figure 2. Photograph 6 of Attachment B depicts this unit.

Date of Startup: This unit began operation in about 1976 (Sadowski, 1991).

Date of Closure: The cadmium dust collection unit is currently operational.

Wastes Managed: The manufacturing process that Ferro uses to produce their Polycheck™ product results in the generation of dust that contains cadmium (D006). The volume of dust that is collected as waste varies with fluctuations in the production rates. The waste that is collected at this unit is shipped offsite for disposal. At the time of the VSI, one partially full 55 gallon drum was noted (PRC, 1991).

Release Controls: The dust collection unit is self contained and the waste is drummed in 55-gallon steel drums.

History of Release: No releases have been documented.

Observations: The unit appeared to be well maintained. No releases were evident.

SWMU 6 **Waste Oil Storage Area**

Unit Description: This SWMU is a 40- by 40-foot outdoor area used for storing waste oil. Fifty-five gallon steel drums of waste oil are staged on wooden pallets on a cement and gravel surface. SWMU 6 is shown in Photograph 7. Figure 2 shows the approximate location of SWMU 2.

Date of Startup: Unknown.

Date of Closure: This unit is currently operational.

Wastes Managed: Waste oil from engine oil changes, wastewater treatment operations (SWMUs 7 and 8), and various other maintenance activities is stored in this area of the facility. The waste is periodically shipped offsite for recycling or disposal.

Release Controls: The waste oil is contained in 55-gallon steel drums outside of the manufacturing building. No additional engineering controls were observed.

History of Release: None documented.

Observations: Unit appeared to be well maintained and no oil stains were observed in the gravel and concrete that surrounds the containers.

SWMU 7 **Epoxy Wastewater Pretreatment Facility**

Unit Description: The epoxy wastewater pretreatment system consists of two holding tanks, a lime silo, and a neutralization tank that are contained in a 80- by 40-foot bermed concrete area. As part of the system, a concrete surge basin and a oil water separator are used to pretreat the wastewater prior to discharge. The epoxy wastewater pretreatment facility is located in the eastern portion of the facility as shown in Figure 2. Photographs 8 and 9 of Appendix B depict two portions of this SWMU.

Date of Startup: The epoxy wastewater pretreatment facility has been used since 1972.

Date of Closure: This unit is currently operational.

Wastes Managed: This SWMU is used primarily to pretreat wastewater from the epoxy manufacturing area of the facility and several of the facility's noncontact wastewater streams. These include: quench water, boiler blowdown, condensate, and cooling water. Several of the facility's indoor floor drains also go to this SWMU (OEPA, undated) as does some storm water runoff (Sadowski, 1991). The wastewater treatment system discharges to the unnamed tributary of Tinkers Creek under the facility's NPDES permit. The sludge generated from the process is nonhazardous and is disposed of offsite (Sadowski, 1991).

Release Controls: The main portion of the area is diked with a concrete wall. Ferro's representatives indicated that a biotreatment system is a planned upgrade in the near future.

History of Release: This unit's discharge is regulated under the facility's NPDES discharge permit. Several discharge violations have occurred.

Observations: During the VSI, the berm surrounding the SWMU had stains indicative of batch process overflows associated with the treatment system. Photograph 8 of Appendix B depicts the stained berm. During the VSI, it was noted that the discharge into the creek did not contain any visible oil or grease, but banks of the creek were stained with oil or grease.

SWMU 8 **Wastewater Treatment Facility**

Unit Description: The wastewater treatment facility consists of an acidification tank, API oil separator, lime precipitation mix tank, pressure filter, and a sludge drop box. These components are used to equalize, break emulsions, separate oil, neutralize, chemically precipitate, separate solids and liquids, and dewater sludge. Adjacent to the building in which these components of the system are housed is the acid storage tank. The wastewater treatment facility's location is shown in Figure 2, and Photograph 10 of Appendix B depicts this unit.

Date of Startup: Ferro's application to install the wastewater treatment facility was submitted in November 1974.

Date of Closure: The treatment facility is currently operational.

Wastes Managed: The wastewater treatment facility is used to treat the facility's contact wastewater and water collected in the catch basin of SWMU 1. The wastewater treatment facility has a continuous process design capacity of 10,000 gallons per day (gpd) but typically produces 5,000 gpd of sewerable waters, 5,000 pounds per day of sludge (at 40% solids), and 55 gallons per month of waste oils (Ferro, 1974; PRC, 1991). The wastewater is discharged to the Southerly wastewater treatment plant via the sanitary sewer system. The drop box located below the pressure filter receives the sludge and it is used transfer the sludge to the sludge bin roll-away container (SWMU 9).

Release Controls: This unit is located inside a building with release controls including interceptor trenches that drain back to the wastewater treatment system. The acid storage tank is surrounded by a containment wall.

History of Release: No releases have been documented from this unit.

Observations: The unit appeared in good condition during the VSI.

SWMU 9 **Sludge Bin Roll Away Container**

Unit Description: This SWMU is a 20-cubic yard steel roll-away container that is used to temporarily store wastewater treatment sludge. The sludge bin roll-away container is covered with a secured tarp and lined with plastic sheeting. The sludge bin roll-away container is located in the eastern edge of the facility as shown in Figure 2. This SWMU was inspected during the VSI and Photograph 11 of Appendix B depicts the unit.

Date of Startup: The unit began operations in 1986.

Date of Closure: This unit is currently operational.

Wastes Managed: The waste managed in this unit is generated from SWMU 8. The wastewater treatment sludge is shipped offsite for disposal. The facility generates 7-cubic yards of sludge per month which is disposed offsite by North East Chemical Company (Hofmeister, 1991). The zinc, barium, and cadmium constituents of the sludge cause the waste to be managed as hazardous (Sadowski, 1991).

Release Controls: The roll-away container is lined with plastic and covered with a tarp (PRC, 1991).

History of Release: No releases have been documented from this unit and none were observed during the VSI.

Observations: The unit appeared to be well maintained.

SWMU 10 **Polyamine Building Construction Area**

Unit Description: Site of a former landfill used to bury drums. The unit consisted of a 6-foot deep trench, 75-feet long and 12- to 20-feet wide. Approximately 15 drums were buried in this unit. This unit was discovered during the construction of the polyamine building.

Date of Startup: Unknown. It is estimated that this unit began operations in 1970 (McLaren/Hart, 1990).

Date of Closure: This unit became inactive on August 25, 1990 by removal of the buried drums, contaminated soil, and ground water (McLaren/Hart, 1990).

Wastes Managed: The wastes managed in this unit included: lead-containing solids and solvent-containing liquid stored in 55-gallon steel drums, corroded steel drums, empty poly drums, laboratory chemical containers, and several pressurized cylinders (McLaren/Hart, 1990).

Release Control: The waste was stored in 55-gallon steel drums. No additional release controls were present.

History of Release: Approximately 250 - 300 cubic yards of visually contaminated soil was removed from this unit during closure activities. An additional 250 - 300 cubic yards of native soil was also removed to ensure clean closure (McLaren/Hart, 1990). Some xylene contaminated perched ground water was also encountered during remediation efforts (amount unknown) (McLaren/Hart, 1990). Contaminated perched ground water was removed from the area. Analytical sampling was conducted to ensure that all contaminated soil had been removed.

Representatives from OEPA's RCRA office were onsite daily to oversee excavation activities (Hofmeister, 1992). McLaren/Hart submitted a report certifying that remediation activities were completed on March 11, 1991. There is no documentation from OEPA regarding approval of remediation activities (Sadowski, 1992).

Observations: The polyamine building has now been constructed on this site. Photograph 12 of Appendix B depicts the approximate location of buried drums and the current location of the polyamine building.

4.0 AREAS OF CONCERN

No AOCs were identified during the PA/VSI.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The PA/VSI identified 10 SWMUs at the Ferro Corporation's Bedford, Ohio facility. Background information on the facility's location, operations, waste generating processes, release history, regulatory history, environmental setting, and receptors is presented in Section 2.0. SWMU-specific information, such as the unit's description, dates of operation, wastes managed, release controls, release history, and observed condition, is discussed in Section 3.0. Following are PRC's conclusions and recommendations for each SWMU. Table 3 identifies the SWMUs at the Ferro facility and suggested further actions.

SWMU 1 **Drum Storage Pad**

Conclusions: The wastes managed in this unit are contained in 55-gallon steel drums on a concrete pad. Access to the unit is controlled by a locked chain link fence. This unit is for storage of waste for a less than 90-day period, prior to offsite disposal. The potential for release of hazardous waste to environmental media is low. The potential for release to soils and ground water is low due to the generally good condition of the unit and the unit's primary and secondary containments. The potential for a release to air is low. The potential for release to surface water is moderate because of a broken drain cap against the southwest wall of the unit. This drain could act as a conduit for hazardous wastes to enter the tributary directly discharging to surface water.

Recommendations: PRC suggests that the broken drain cap against the southwestern wall be repaired to minimize the potential for releases via this conduit.

SWMU 2 **Satellite Accumulation Areas**

Conclusions: The wastes managed in the facility's six satellite accumulation areas are contained in 55-gallon steel drums within the facility's buildings. No spills have been recorded from these units. The potential for release to ground water, surface water, air and soil because of indoor handling of wastes is low.

Recommendations: PRC suggests no further action at this time.

SWMU 3 **R & D Container Storage Area**

Conclusions: Drummed waste is staged in this area prior to offsite disposal. The area is outside on a raised concrete loading platform. Evidence of a past release to onsite soil was observed during the VSI. The potential to release to ground water, surface water, and air is moderate because of the stained soil and the lack of adequate secondary containment.

Table 3

SWMU Summary

	SWMU	Operational Dates	Evidence of Release	Suggested Further Action
1.	Drum Storage Pad	1984 - present	None	Repair broken drain cover
2.	Satellite Accumulation Areas	Unknown - present	None	No further action
3.	R & D Container Storage Area	Unknown - present	Stained soil observed during VSI.	Soil sampling
4.	Drum Storage in the Boiler Room	Unknown - 1984	None	No further action
5.	Cadmium Dust Collection Unit	1970 - present	None	No further action
6.	Waste Oil Storage Area	Unknown - present	None	No further action
7.	Epoxy Wastewater Pretreatment Facility	1982 - present	Sediment staining observed during VSI.	Check oil water separator efficiency and sediment sampling
8.	Wastewater Treatment Facility	1972 - present	None	No further action
9.	Sludge Bin Roll Away Container	1986 - present	None	No further action
10.	Polyamine Building Construction Area	Unknown - possibly 1970s	Yes	Review remediation reports to ensure that no residual contamination exists.

Recommendations: It is not clear whether the stained soil resulted from waste management activities associated with this SWMU or spills associated with loading and unloading activities. Because of the stained soil and inadequate secondary containment, PRC recommends that soils below the concrete platform be sampled and analyzed for hazardous constituents.

SWMU 4 **Drum Storage in the Boiler Room**

Conclusions: This unit consisted of several areas throughout the facility used for the temporary accumulation of hazardous waste. Wastes stored in this area are presented in Table 2. In recent years, the practice of storing waste in various areas of the facility was stopped and SWMU 1 now is used to temporarily store that waste. The potential for past release to all environmental media is low.

Recommendations: No further action is recommended for this unit.

SWMU 5 **Cadmium Dust Collection Unit**

Conclusions: The potential for this unit to release to ground water, surface water, air, and soil is low. No documented releases have been noted. The design and operation of the unit provide adequate containment for the wastes managed in this SWMU.

Dust containing heavy metals, generated from the production of Ferro's products, is periodically cleaned from the manufacturing building floor and drummed in 55-gallon steel barrels. These barrels are stored at the drum storage pad (SWMU 1). This dust is not collected in SWMU 5 prior to being place in SWMU 1.

Recommendations: No further action is recommended for this unit.

SWMU 6 **Waste Oil Storage Area**

Conclusions: The waste oil storage area unit is located outside on a mixed gravel and concrete surface. The waste is contained in 55-gallon steel drums. No releases have been documented and none were observed during the VSI. There is a low potential for release to all environmental media from this unit.

Recommendations: PRC suggests no further action at this time.

SWMU 7 **Epoxy Wastewater Pretreatment Facility**

Conclusions: This SWMU is used to pretreat wastewater from the epoxy manufacturing area, and noncontact cooling wastewater from the facility's quench water,

boiler blow down, condensate, and cooling waters. The banks of the creek that receive discharges from the system were stained in some areas. This same problem was noted in previous inspections conducted by OEPA. The release potential to ground water, air and soil is low because of secondary containment of the unit. The release potential to surface water is high because of the inefficiency of the oil-water separator.

Recommendations: PRC concurs with the recommendations made by the OEPA in an earlier inspection. The oil water separator's efficiency should be checked. Sampling of visibly stained sediment along the banks of the tributary should be completed to determine if hazardous constituents have been released.

SWMU 8 **Wastewater Treatment Facility**

Conclusions: This SWMU is used to treat contact wastewater generated during facility operations. The majority of the wastewater treatment facility is located indoors and has interceptor trenches which drain back to the system. No documented releases have been identified. The release potential to all environmental media is low.

Recommendations: No further action is recommended at this time.

SWMU 9 **Sludge Bin Roll Away Container**

Conclusions: This 20 cubic yard roll away container is used to contain wastewater treatment sludge. The unit is lined with plastic and covered with a tarp. No releases have been documented and none were observed during the VSI. This unit has a low release potential to ground water, surface water, air, and soil.

Recommendations: PRC recommends no further action at this time

SWMU 10 **Polyamine Building Construction Area**

Conclusions: A release to perched ground water and on-site soils was documented in the Buried Drum Cleanup Report prepared by McLaren/Hart in February, 1991. The perched ground water and approximately 500 - 600 cubic yards of soil was excavated from the buried drum area (McLaren/Hart, 1991). Representatives from OEPA's RCRA office were onsite daily during remediation activities. The potential for a release to air and surface water is low because the drums were located under ground. This area has since been backfilled and the Polyamine building has been constructed.

Recommendations: PRC recommends that a comprehensive review of cleanup activities at this SWMU be completed and the issue of ground water contamination be addressed because xylene was identified in perched ground water during remediation efforts. Analytical soil testing results should also be reviewed to ensure that hazardous constituents are not present in the soils or ground water at levels above health-based standards.

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ATTACHMENT A

EPA PRELIMINARY ASSESSMENT FORM 2070-12

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
OH	D004161410

II. SITE NAME AND LOCATION

01 SITE NAME *(Legal, common, or descriptive name of site)*	02 STREET, ROUTE NO. OR SPECIFIC LOCATION IDENTIFIER				
Ferro Corporation, Chemical Division	7050 Krick Road				
03 CITY	**04 STATE**	**05 ZIP CODE**	**06 COUNTY**	**07 COUNTY CODE**	**08 CONG DIST**
Walton Hills	OH	44146	Cuyahoga	035	19
09 COORDINATES: LATITUDE	**LONGITUDE**				
81°31"48'	41°22"15'				

10 DIRECTIONS TO SITE *(Starting from nearest public road)*
From Ohio Turnpike go north on State Route 8, 8 miles, left into industrial park (Krick Road #7050).

III. RESPONSIBLE PARTIES

01 OWNER *(if known)*	02 STREET *(Business, mailing residential)*		
Ferro Corporation	1000 Lakeside Avenue		
03 CITY	**04 STATE**	**05 ZIP CODE**	**06 TELEPHONE NUMBER**
Cleveland	OH	44114	(216) 641-8580
07 OPERATOR *(If known and different from owner)*	**08 STREET** *(Business, mailing, residential)*		
09 CITY	**10 STATE**	**11 ZIP CODE**	**12 TELEPHONE NUMBER**

13 TYPE OF OWNERSHIP *(Check one)*
☒ A. PRIVATE ☐ B. FEDERAL: _____ (Agency Name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER _____ (Specify) ☐ G. UNKNOWN

14. OWNER/OPERATOR NOTIFICATION ON FILE *(Check all that apply)*
☐ A. RCRA 3010 DATE RECEIVED: ___/___/___ (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE *(CERCLA 103 c)* DATE RECEIVED: ___/___/___ (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
☒ YES DATE 08/15/91
☐ NO

BY *(Check all that apply)*
☐ A. EPA ☒ B. EPA CONTRACTOR ☐ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: _____ *(Specify)*

CONTRACTOR NAME(S): PRC Environmental Management, Inc.

02 SITE STATUS *(Check one)*
☒ A. ACTIVE ☐ B. INACTIVE ☐ C.UNKNOWN

03 YEARS OF OPERATION
1940s (BEGINNING YEAR) | Present (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED

Approximately 20 drums of hazardous waste in storage areas, 20 yd^3 of sludge (TCLP), and 3 drums of waste oil.

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

Remediation of buried drum site has not been reviewed by regulatory authorities.

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION *(Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents.)*
☐ A. HIGH *(Inspection required promptly)* ☒ B. MEDIUM *(Inspection required)* ☐ C. LOW *(Inspect on time-available basis)* ☐ D. NONE *(No further action needed; complete current disposition form)*

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF *(Agency/Organization)*			03 TELEPHONE NUMBER
Kevin Pierard	U.S. EPA			(312) 886-4448
04 PERSON RESPONSIBLE FOR ASSESSMENT	**05 AGENCY**	**06 ORGANIZATION**	**07 TELEPHONE NUMBER**	**08 DATE**
Sharon McLellan		PRC-EMI	(703) 883-8821	09/20/91 (MONTH DAY YEAR)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
OH	D004161410

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES *(Check all that apply)*

- ☐ A. SOLID
- ☒ B. POWDER, FINES
- ☒ C. SLUDGE
- ☐ D. OTHER _____ *(Specify)*
- ☐ E. SLURRY
- ☒ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE
(Measures of waste quantities must be independent)

TON _____

CUBIC YARDS 20 yd^3

NO. OF DRUMS 20

03 WASTE CHARACTERISTICS *(Check all that apply)*

- ☒ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☐ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☐ G. INFLAMMABLE
- ☒ H. IGNITABLE
- ☐ I. HIGHLY VOLATILE
- ☒ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE	20	yd^3	TCLP
OLW	OILY WASTE	3	55-gal drums	Waste oil
SOL	SOLVENTS	5	55-gal drums	F003, F005
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS	12	55-gal drums	D005, D006, D008

IV. HAZARDOUS SUBSTANCES *(See Appendix for most frequently cited CAS Numbers)*

CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
D001	UM&P Naphtha		Drum/off-site		
D006	Cadmium dust		Drum/off-site		
D005	Barium		Drum/off-site		
D008	Lead		Drum/off-site		
F005	MEK		Drum/off-site		
F003	Xylene		Drum/off-site		
F003	Methanol		Drum/off-site		
F003	Mineral spirits		Drum/off-site		

V. FEEDSTOCKS *(See Appendix for CAS Numbers)*

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION *(Cite specific references; e.g., state files, sample analysis, reports)*

OEPA and USEPA files

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE: OH	02 SITE NUMBER: D004161410

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: 08/09/90) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

Buried drums located during construction activities. Groundwater contaminated with xylene was also found. Ferro conducted remedial efforts.

01 ☐ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

None noted.

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

None noted.

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

None noted.

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

None noted.

01 ☒ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE: 08/09/90) ☐ POTENTIAL ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: 1.5 (Acres) — 04 NARRATIVE DESCRIPTION

Buried drums uncovered during construction activities. Approximately 12 drums were removed and 550 yd^3 of soil. Visibly stained soils observed during VSI.

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

None noted.

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

None noted.

01 ☐ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

None noted.

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE: OH	02 SITE NUMBER: D004161410

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE:_____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

None noted.

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE:_____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

None noted.

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE:_____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

None noted.

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES — 02 ☐ OBSERVED (DATE:_____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

None noted.

01 ☐ N. DAMAGE TO OFF-SITE PROPERTY — 02 ☐ OBSERVED (DATE:_____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

None noted.

01 ☐ O. CONTAMINATION OF SEWERS, DRAINS, WWTPS — 02 ☐ OBSERVED (DATE:_____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

None noted.

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE:_____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

None noted.

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED:_____

IV. COMMENTS

Ferro's final remedial report to regulatory agencies was submitted.

V. SOURCES OF INFORMATION ***(Cite specific references; e.g., state files, sample analysis, reports)***

OEPA and USEPA files